CLAIMS

1. Control equipment for an extracorporeal blood circuit (2), in which the extracorporeal circuit (2) is connected to a blood purification machine and comprises an access branch (8) and a return branch (10) connected to at least one blood treatment element (4; 4, 11a; 4, 11v; 25; 25, 11a; 25, 11v); the equipment (14) comprising a sensor (16) for measuring a first temperature (TP) of the blood leaving a patient (P) along the access branch (8) upstream of the said element (4; 4, 11a; 4, 11v; 25; 25, 11a; 25, 11v), a control unit (15) for regulating the blood temperature (T) as a function of the first temperature (TP) and of a reference temperature (Tset); the equipment being characterized in that it comprises a device (18) for regulating the blood temperature (T), connected to a portion (19) of the return branch (10) and downstream of the said blood treatment element (4; 4, 11a; 4, 11v; 25; 25, 11a; 25, 11v).

2. Equipment according to Claim 1, characterized in that the said regulating device (18) is combined with the said portion (19) to form a heat exchanger; the said control unit (15) being connected to the said temperature regulating device (18).

3. Equipment according to Claim 1 or 2, characterized in that the said regulating device (18) comprises a line (20) for conveying a fluid which can be heated to a temperature (Tf) lying within a specified range and equal to a temperature of approximately 37°C.

4. Equipment according to one of Claims 1 to 3, characterized in that the said regulating device (18) has a seat (21) for housing the said portion (19) of the return branch (10).

5. Equipment according to one of Claims 1 to 4, characterized in that the said extracorporeal circuit (2) is connected to a pump (9) for conveying the blood along the extracorporeal circuit (2), the equipment (14) comprising a sensor (17) for detecting the operating state of the pump (9); the control unit (15) keeping the temperature (Tf) of the said fluid equal to the said predetermined temperature (Tset) when the pump (9) is not in operation.

6. Equipment according to one of Claims 1 to 5, characterized in that the said return branch (10) comprises an expansion chamber (11v); the said second portion (19) being located downstream of the expansion chamber (11).

7. Equipment according to any one of Claims 1 to 6, characterized in that the said blood treatment element (4; 4, 11a; 4, 11v; 25; 25, 11a; 25, 11v) is formed by a haemodialysis filter (4) comprising a blood compartment (5) and a dialysate compartment (6), within which a dialysate flows.

8. Equipment according to one of Claims 1 to 6, characterized in that the said blood treatment element (4; 4, 11a; 4, 11v; 25; 25, 11a; 25, 11v) comprises a haemodialysis filter (4) comprising a blood compartment (5) and a dialysate compartment (6), within which a dialysate flows, and an expansion chamber (11a; 11v), into which a replacement fluid is fed.

9. Equipment according to one of Claims 1 to 6, characterized in that the said blood treatment element (4; 4, 11a; 4, 11v; 25; 25, 11a; 25, 11v) is formed by a haemofiltration filter (25).

10. Equipment according to one of Claims 1 to 6, characterized in that the said blood treatment element (4; 4, 11a; 4, 11v; 25; 25, 11a; 25, 11v) comprises a haemofiltration filter (25) and an expansion chamber (11a; 11v), into which a replacement fluid is fed.

11. Equipment according to Claim 1, characterized in that the said control unit (15) regulates the temperature (T) as a function of the first temperature (TP) and of the reference temperature (Tset) at predetermined intervals of time.

12. Equipment according to Claim 1 or 11, characterized in that the said control unit (15) regulates the temperature (T) as a function of the difference between the first temperature (TP) and the reference temperature (Tset).

13. Control method for an extracorporeal circuit (2) for the circulation of blood in a blood purification machine, the extracorporeal circuit (2) comprising an access branch (8) and a return branch (10) which are connected to at least one blood treatment element (4; 4, 11a; 4, 11v; 25; 25, 11a; 25, 11v); the method comprising the steps of:

a) measuring a first temperature (TP) of the blood leaving a patient (P) along the access branch (8); and

b) regulating the blood temperature (T) as a function of the first temperature (TP) and of a reference temperature (Tset);

the method being characterized in that the blood temperature (T) is regulated along a portion (19) of the return branch (10) and downstream of the said blood treatment element (4; 4, 11a; 4, 11v; 25; 25, 11a; 25, 11v).

14. Method according to Claim 13, characterized in that the steps a) and b) are repeated at intervals of time during the blood purification treatment.

15. Method according to Claim 13 or 14, characterized in that the temperature difference (ΔT) between the first temperature (TP) and the reference temperature (Tset) is calculated and in that the temperature (T) of the blood is regulated as a function of the said temperature difference (ΔT).

16. Method according to Claim 15, characterized in that the heat exchange of a heat exchanger formed by the said portion (19) and by a temperature regulating device (18) connected to the said portion (19) is regulated.

17. Method according to Claim 15 or 16, characterized in that heat is withdrawn from the blood along the said portion (19) when the said temperature difference (ΔT) is positive.

18. Method according to Claim 15 or 16, characterized in that heat is supplied to the blood along the said portion (19) when the said temperature difference (ΔT) is negative.

19. Method according to any one of Claims 13 to 18, characterized in that a fluid is conveyed along the said temperature regulating device (18) and in that the temperature (Tf) of the said fluid is varied within a specified range in the vicinity of a temperature of 37° C.

20. Method according to Claim 19, characterized in that the blood is conveyed along the extracorporeal circuit (2) by means of a pump (9), in that the state of operation of the pump (9) is detected, in that the temperature (Tf) of the said fluid is regulated as a function of the first temperature (TP) and of the reference temperature (Tset), and in that the temperature of the said fluid (Tf) is kept equal to the predetermined reference temperature (Tset) when the pump (9) is not in operation.

21. Method according to any one of Claims 13 to 20, characterized in that the reference temperature (Tset) is varied during the treatment according to a specified profile.

22. Method according to any one of Claims 13 to 21, characterized in that the said extracorporeal circuit (2) is used for a haemodialysis treatment; the said blood treatment element (4; 4, 11a; 4, 11v; 25; 25, 11a; 25, 11v) being formed by a haemodialysis filter (4) through which the blood and a dialysate flow in counterflow mode.

23. Method according to any one of Claims 13 to 21, characterized in that the said extracorporeal circuit (2) is used for a haemodiafiltration treatment; the said blood treatment element (4; 4, 11a; 4, 11v; 25; 25, 11a; 25, 11v) comprising a haemodialysis

filter (4) through which the blood and a dialysate flow in counterflow mode, and an expansion chamber (11a; 11v) supplied with a replacement fluid.

24. Method according to any one of Claims 13 to 21, characterized in that the said extracorporeal circuit (2) is used for a pure haemofiltration treatment; the said blood treatment element (4; 4, 11a; 4, 11v; 25; 25, 11a; 25, 11v) comprising a haemofiltration filter (25) through which the blood flows.

25. Method according to one of Claims 13 to 21, characterized in that the said extracorporeal circuit (2) is used for a haemofiltration treatment; the said blood treatment element (4; 4, 11a; 4, 11v; 25; 25, 11a; 25, 11v) comprising a haemofiltration filter (25) through which the blood flows, and an expansion chamber (11a; 11v) supplied with a replacement fluid.